4-14-2021

2021 Undergraduate Research Symposium Abstract Book

Academic Center for Enrichment

Back

Displaying agenda in your event timezone (1:02 PM CDT)

Wednesday, April 14

Chancellor Michelle Behr's Welcome

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Speaker

- **Michelle Behr** (Speaker) Chancellor, University of Minnesota, Morris

Description

Chancellor Michelle Behr's welcome to the Undergraduate Research Symposium (URS).

Back

Displaying agenda in your event timezone (1:02 PM CDT)

Wednesday, April 14

From Our Alumni

Alumni Perspective

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Speakers

- **Sam Bruno** (Speaker) Alumni
- **M.r. Fitzgerald** (Speaker) Alumni

Description

In 2013 Samantha Bruno and Megan Fitzgerald were the Featured Presenation with: VIII: Unfolding Possibilities through Interactive Book Structure

Take a peek at their message for current Morris students and how the URS shaped what they are doing today!

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Displaying agenda in your event timezone (12:42 PM CDT)

Wednesday, April 14

From Our Alumni

Alumni Perspective

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Speaker

- **Alexa Barta** (Speaker) Alumni

Description

Alexa Barta '18 reflects on their time at the University of Minnesota Morris.

Back

Displaying agenda in your event timezone (12:42 PM CDT)

Wednesday, April 14

From Our Alumni

Alumni Perspective

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Speaker

- **Zak Threadgill** (Speaker) Alumni

Description

Zak Threadgill was the 2015 URS Featured Presenter. He was a CMR major and his presentation was called, "Thready Beats Finding a Place in the Mix," which was a live mixing demonstration.

The experience of being a Featured Presenter at the URS eventually gave him the confidence to open his own studio in Minneapolis.

Displaying agenda in your event timezone (12:43 PM CDT)

Wednesday, April 14

Musical Performance

Musical Performances

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Oculi omnium, Alexander L'Estrange
UMN Morris Chamber Singers
Bradley Miller, conductor
Recorded February 2021
UMN Morris Humanities Fine Arts Recital Hall

Displaying agenda in your event timezone (12:43 PM CDT)

Wednesday, April 14

Musical Performance

Musical Performances

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Threnody (2021)- Christopher Marshall

The Symphonic Winds gives the first performance of *Threnody* by Christopher Marshall.
The composer writes, "The word 'threnody' comes from the Greek, meaning 'song of mourning.' The music memorializes the loss of so many, and the pain experienced by countless others during the years of the coronavirus pandemic, 2020-21. *Threnody* uses a 12-tone theme in a triadic-tonal context."
As with other pieces by Chris, that the ensemble has performed, it is an expressive, melodic work that carries an emotional impact.

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Displaying agenda in your event timezone (12:43 PM CDT)

Wednesday, April 14

Research Opportunities in the Chemistry Discipline

Research Opportunities

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Learn more about exciting research opportunities in the Chemistry Discipline at the University of Minnesota, Morris.

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Displaying agenda in your event timezone (12:44 PM CDT)

Wednesday, April 14

Research Opportunities in the Math Discipline

Research Opportunities

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Learn about the exciting research opportunities in the Math Discipline at the University of Minnesota, Morris.

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Displaying agenda in your event timezone (12:44 PM CDT)

Wednesday, April 14

Research Opportunities in the Education Discipline

Research Opportunities

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Learn about the exciting research opportunities available in the Education Discipline at the University of Minnesota, Morris.

Displaying agenda in your event timezone (12:44 PM CDT)

Wednesday, April 14

Research Opportunities in the Communication, Media & Rhetoric Discipline

Research Opportunities

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Learn about the exciting research opportunities available with the CMR Discipline at the University of Minnesota, Morris.

Back

Displaying agenda in your event timezone (12:44 PM CDT)

Wednesday, April 14

Adding Academic Experiences to Your Resume

Student Research Resource

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Learn about how and why you should add academic experiences to your resume or CV.

Back

Displaying agenda in your event timezone (12:45 PM CDT)

Wednesday, April 14

What is McNair?

Student Research Resource

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Named after the fallen Astronaut and Laser Physicist Dr. Ronald E. McNair, the mission of the McNair program is to prepare eligible participants for doctoral studies through involvement in research and other scholarly activities. McNair scholars present their scholarly research at professional conferences. Participants attend McNair Conferences and network with their peers and other professionals. Learn more about the TRIO McNair Scholars Program at the University of Minnesota, Morris!

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Displaying agenda in your event timezone (12:45 PM CDT)

Wednesday, April 14

The World of Research

Student Research Resource

Wednesday, April 14

10:00 am - 10:00 pm

Recorded Video: Watch video

Description

Take a look at the McNair Scholars program offered at the University of Minnesota Morris. This panel interview will explore what undergraduate research involves.

Displaying agenda in your event timezone (12:45 PM CDT)

Wednesday, April 14

An Investigation of the Influence of Compounds Contained in Several Medicinal Plants on a Cellular Level

Chemistry | _Poster or Visual Display Remote

Wednesday, April 14

11:00 am - 12:00 pm

Humanities 111

Live Stream: Join stream

Speaker

- **Sydney Swanson** (Speaker) Chemistry

Description

Medicinal plants are used by indigenous peoples to treat many ailments from fevers, lesions, stomach, and heart problems. We have been working on isolating natural products from several native prairie plants that are traditional medicinal plants used as febrifuge, or fever reducing, infusions: *Comptonia peregrina, Monarda fistulosa, Thalictrum dasycarpum*. Previously work has been done to extract and identify a variety of compounds in these plants. We are isolating and characterizing a mix of previously known and new compounds. To date, we have extracted and isolated thirteen individual compounds from *Comptonia peregrina*; two of them are known active compounds. These compounds were volatile enough to be able to be identified with a gas chromatography mass spectrometer (GCMS) in combination with nuclear magnetic resonance (NMR). The GCMS provides information about the mass of the compounds and the NMR provides further structural information so we can confirm the identity of the isolated compounds. Work is ongoing to collect both GCMS data and NMR confirmation data on all compounds. This project is done in collaboration with the Rachel Johnson lab, which is in the process of testing the crude extracts as well as our individually isolated compounds for their effect on macrophage cell lines. This collaboration will allow us to study the pharmacological impact of these extracts. In other words we will know how effective the crude extracts and isolated compounds are as fever reducers.

Faculty Adviser: Kara Nell

Displaying agenda in your event timezone (12:45 PM CDT)

Wednesday, April 14

Integration of PyMOL into the Undergraduate Biochemistry Curriculum

Chemistry | Poster or Visual Display In-person

Wednesday, April 14

11:00 am - 12:00 pm

Humanities 11

Live Stream: Join stream

Speaker

- **Cal Mergendahl** (Speaker) Chemistry

Description

PyMOL, an open source, Python-based software used for protein modeling, has been in use for over twenty years. PyMOL is a powerful tool that allows the user to import protein structures, build their own models, examine changes resulting from mutagenesis, and produce high-quality graphics of protein and molecular structures. This array of functionality has made it useful for biology and biochemistry researchers, particularly for rendering of attractive images in research papers. For these reasons, PyMOL proficiency is considered increasingly important for undergraduates studying in these fields, and much work has been done to introduce it into the undergraduate curriculum. The purpose of this research was to integrate PyMOL into an introductory biochemistry class by testing out various features of the program to gauge simplicity and usefulness in order to establish which were most important to introduce to first-time users, as well as writing questions and activities that were designed to teach said features. The result of this was a laboratory activity & worksheet for use in a biochemistry course designed to provide an introduction to PyMOL and some of its capabilities: importing structures from the Protein Data Bank, examining sequences, measuring distances, and portraying structural differences. Finally, the lab was integrated into the biochemistry curriculum at the University of Minnesota Morris during fall of 2020 for evaluation; it was judged to have met its goals.

Faculty Adviser: Alyssa Pirinelli

Displaying agenda in your event timezone (12:46 PM CDT)

Wednesday, April 14

Nyama: Energy in Everything

French .Panel Presentation In Person

Wednesday, April 14

11:10 am - 11:35 am

Edson Auditorium

Live Stream: Join stream

Speakers

- **Estella Acevedo** (Speaker) French
- **Molly Falnes** (Speaker) French
- **Biz Rathbun** (Speaker) French

Description

Our topic is on the Mande people who believe that everything in the universe contains energy, and that life is cyclical, this energy is called nyama. Though colonization has eliminated the importance of African spirituality in Africa, we argue that nyama is still entirely relevant to the Mande people, as seen in West African films. We're currently learning about this in our Sub-Saharan Francophone Cinema class, and have plans to write papers about nyama as well. Just as religion often plays a role in occidental movies, nyama is a concept that is heavily used in West African films as well. Our goal with this presentation is to bring awareness of a unique culture that is not well known outside of its region of origin to campus. In this presentation one of us will define and discuss the concept of nyama in general, as well as explaining how it is distributed by profession, for example, the Nyamakala are hunters, weavers, blacksmiths, potters, and storytellers, who possess the most amount of nyama. Another one of us will discuss the different ways in which nyama manifests itself, such as through nature, through people, and through death. Finally, one of us will talk about the duality of nyama -- the good versus the bad, the female versus the male, and life versus death. Each of us will base our discussion on a short clip or still image from an African film.

Faculty Adviser: Sarah Buchanan

Displaying agenda in your event timezone (12:46 PM CDT)

Wednesday, April 14

Coins, Crusades, and Royal Conflict: The Tower of David on King Baldwin III's Royal Coinage

.Oral Presentation Remote | Honors

Wednesday, April 14

11:20 am - 11:40 am

Humanities 205

Live Stream: Join stream

Speaker

- **Alex Carroll** (Speaker) Honors

Description

Soon after the Second Crusade (1147-1149 C.E.), King Baldwin III of Jerusalem began minting his own coins, which bore the image of the Tower of David. Since Crusader coins were seen and circulated by average subjects who might never meet the king in person, the choice of coin design was an important opportunity for rulers to create a public image for themselves. For example, future kings of Jerusalem would depict iconic buildings, such as the Church of the Holy Sepulchre, on their coins to signify their religious devotion. Thus far, scholars have not explained why King Baldwin III selected the Tower of David as his royal symbol. Built in 37 B.C.E. by King Herod, this fortified tower continued to provide strong military defenses at the time of the Crusades. This research combines analyses of the history of Jerusalem's kings, Crusader coinage, and Holy Land architecture to explain King Baldwin III's coin design. The research reveals that the Tower of David symbolized military strength, connected Baldwin to the historical King David, and symbolized the most important event in Baldwin's ascent to power, his victory over his mother, Queen Melisende, which occurred at the Tower of David. In brief, this presentation will explain the reasons behind the emblem choice of this enigmatic Crusader king.

Faculty Adviser: Jimmy Schryver

Displaying agenda in your event timezone (12:46 PM CDT)

Wednesday, April 14

"Slapping a ramp on it isn't enough": A History of Disability Access and Advocacy on the Morris Campus

.Oral Presentation Remote | Disability Studies

Wednesday, April 14

11:20 am - 11:40 am

Humanities 6

Live Stream: Join stream

Speaker

- **Marie Anderson** (Speaker) Communication, Media, and Rhetoric

Description

This presentation explores the history of disability access and advocacy at UMN Morris using the social model - rather than the medical model - for understanding disability. The medical model prompts the disabled individual to pursue a cure or to strive to overcome barriers; the social model focuses on physical barriers and societal prejudices as disabling elements of a person's experience and promotes shared responsibility for changing them. The history of UMN Morris spans well over a century and includes three different institutions: campus facilities served as an American Indian Boarding School from 1887 to 1909, as the West Central School of Agriculture from 1910 to 1963, and as UMN Morris from 1960 to the present. While this work highlights its evolution as a liberal arts college, UMN Morris's history makes it an excellent example of what spaces mean and how they reflect contemporary and evolving societal values. Drawing upon material from disability and access studies, civil rights law, and universal design, as well as interviews with key stakeholders, my research suggests that this history is shaped by more than political will. Access is subject to legislative process, shifting funding priorities, and the imperative to preserve historic buildings, making the transformation of physical spaces and prejudiced ideas long-winded and ongoing work. There is much we can do in the meantime to support the full participation, learning, and success of everyone in the UMN Morris community.

Faculty Adviser: Tammy Berberi

Displaying agenda in your event timezone (12:46 PM CDT)

Wednesday, April 14

Changes in influence with Baroque Men's Fashion in France and Italy

Art History | .Oral Presentation In-person

Wednesday, April 14

11:40 am - 12:00 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Sarah Hill** (Speaker) Art History

Description

In this presentation I will share my exhibition proposal, which documents the shift in political power from Spain to France through clothing depictions in seventeenth-century French and Italian art, alongside historical garments. I will use methods of visual analysis to demonstrate changes in the shape of men's attire and its effects on silhouettes of early and later Baroque clothing depictions, using Gian Lorenzo Bernini's *Self Portrait of a Mature Man* (1635) and garments such as: *French Doublet* (1620-1625) and *Italian Waistcoat* (1630-1700). I will also use socio-historical analysis to expand upon the shift from Spanish to French dominance, with Caravaggio's *Gypsy Fortune Teller* (1595) and The Le Nain Brothers' *Smokers in an Interior* (1643). I will additionally consider the influence political leaders and monarchs have on fashion trends with Peter Paul Rubens' *Portrait of Louis XIII, King of France* (1622-1625). This project expands upon François Boucher's ideas in *20,000 Years of Fashion* by demonstrating Spanish influence in the early Baroque, with *Gypsy Fortune Teller* (1595) and *French Doublet* (1620-1625), to French influence in the mid-seventeenth century with *Smokers in an Interior* (1643) and *Italian Waistcoat* (1630-1670). I will also expand upon Marzia Cataldi Gallo's ideas in *Per una storia del costume genovese* by demonstrating Spanish influence on Italy in the early Baroque through the use of Valona collars in Gian Lorenzo Bernini's *Self Portrait of a Mature Man.* The incorporation of clothing in this exhibition will provide a tangible tool for understanding the depictions of clothing in Baroque art.

Faculty Adviser: Julia Dabbs

Displaying agenda in your event timezone (12:47 PM CDT)

Wednesday, April 14

Native UMN Students': Historical Losses, Connectedness, Ethnic Identity, & Wicozani

.Oral Presentation Remote | Psychology

Wednesday, April 14

11:40 am - 12:00 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Alexandra Zuk** (Speaker) University of Minnesota Morris

Description

The goal of the study was to examine Native University of Minnesota (UMN) students' perceptions of historical losses, connectedness, ethnic identity, and Wicozani (i.e., overall health and well-being). Participants from four UMN campuses (i.e., Crookston, Duluth, Morris, Twin Cities; N = 43) completed the Historical Losses Growth Scale, Associated Symptoms Scale, Awareness of Connectedness Scale, Multigroup Ethnic Identity Measure-Revised, and Wicozani Instrument. Participants from all four campuses indicated that Wicozani is important to their quality of life, however those who attended UMN Morris rated their mental, physical, and spiritual health as lower than Native students on the other campuses. Participants from the UMN Morris also reported significantly higher emotional responses (i.e., anger, avoidance, anxiety, and depression) to perceived historical losses than Native students on the other campuses. Although participants from the UMN Morris reported higher emotional responses, they reported thinking about the historical losses as often as students from the other campuses. Participants from all campuses reported similar levels of connectedness to themselves as individuals, their families, their communities, and the natural environment around them; exploration of their ethnic identity (e.g., asking questions and seeking cultural knowledge); and commitment to their ethnic identity (e.g., feeling a strong sense of belonging, membership, and attachment to their ethnic group). Future research is needed to explore why students at UMN Morris rate their Wicozani as lower and their emotional responses as higher than students on the other campuses.

Faculty Adviser: Heather Peters

Displaying agenda in your event timezone (12:47 PM CDT)

Wednesday, April 14

Cultivating the Coronavirus

Communication, Media & Rhetoric | .Poster or Visual Display In-person

Wednesday, April 14

12:00 pm - 1:00 pm

Humanities 11

Live Stream: Join stream

Speaker

- **Calvin Pearce** (Speaker) Communication, Media, and Rhetoric

Description

Media exposure may have an impact on the viewer's perception of reality, which can influence their actions. In a study of perceptions a random group of 228 people completed an anonymous survey asking about their demographics, media exposure, and their fears and thoughts about the coronavirus pandemic. Of the participants, 196 answered the entire survey. From correlational analysis, one of the more interesting results is that participants with more media exposure were more likely to fear the pandemic than those who did not view as much. Those participants also claimed to do more social distancing practices. Participants who claimed to watch CNN and participants who claimed to watch Fox had different views. CNN viewers, on average, feared the virus more than Fox viewers. CNN viewers also claimed to have practiced better social distancing than the Fox viewers, and would not trust Trump more than Fauci regarding the virus, while Fox viewers were split on who they would trust more. The age of the participants also showed correlation with their fears and precautions relating to covid, this is likely because the virus negatively affects older people more. These results support cultivation theory which claims that individuals who engage with a lot of media are likely to perceive the world's reality as it is presented within the media they are exposed to, which in effect affects the viewers attitude and their actions.

Faculty Adviser: Barbara Burke

Displaying agenda in your event timezone (12:47 PM CDT)

Wednesday, April 14

Automated Specification Generation for Clojure Error Messages

.Oral Presentation Remote | Computer Science

Wednesday, April 14

12:00 pm - 12:20 pm

Humanities 205

Live Stream: Join stream

Speaker

- **Carter Plasek** (Speaker) Computer Science

Description

Clojure is a relatively new programming language that has features which could be beneficial for beginners; unfortunately its error messages are often confusing for those who are new to programming. There is an ongoing project at the University of Minnesota Morris which aims to make Clojure more suitable for an introductory class environment. The current system provides an environment which replaces the native Clojure error messages with easier to interpret alternatives. However, the current system relies on tedious manual effort to generate the specifications it requires. As a component in the continuing development of a system to produce more beginner friendly error messages for the Clojure programming language, my project focuses on reducing the human effort required to produce accurate specifications for error checking. Whereas the current system relies on a human to review documentation and source code to write specifications, this project aims to replace much of this process with an automated system. This talk will give an overview of the pipeline from embedded information about the functions at hand, to an intermediate review process, to generating the specifications and the resulting error messages. The generated error messages will be compared side by side with the default Clojure error messages.

Faculty Adviser: Elena Machkasova

Displaying agenda in your event timezone (12:47 PM CDT)

Wednesday, April 14

Randomly Sampling Loci for Genetic Diversity Measurements Across Subpopulations of L. chiricahuensis for Efficient Species Conservation.

.Poster or Visual Display Remote | Biology

Wednesday, April 14

12:00 pm - 1:00 pm

Humanities 211

Live Stream: Join stream

Speaker

- **Ryan Spry** (Speaker) Biology

Description

The Chiricahua Leopard Frog (*Lithobates chiricahuensis*) is a threatened species native to the Southwest United States and Northern Mexico. The freshwater habitats of the Chiricahua leopard frog are currently disappearing due to land use changes. Conservation efforts have focused on reintroduction and captive breeding programs, but wildlife agencies are concerned due to increased inbreeding within captive populations. This can result in higher levels of homozygosity and reduced genetic diversity within a population. To provide guidance for future breeding efforts, we sequenced 91 loci (a specific location on a chromosome) across 90 individuals from all parts of the Chiricahua Leopard Frog range and quantified the genetic diversity at each population. We sampled different proportions of loci from the 90 loci in R (a statistical computing software), where measurements of genetic diversity could be done. We provide a cost-benefit analysis on how many loci need to be analyzed to accurately measure genetic diversity in threatened populations. This information will be shared with conservation organizations responsible for managing this species in order to inform future management decisions.

Faculty Adviser: Robert Denton

Displaying agenda in your event timezone (12:48 PM CDT)

Wednesday, April 14

Functionalized Silica Adsorbents for Oxyanion Trace Capture

Chemistry ,Poster or Visual Display Remote

Wednesday, April 14

12:00 pm - 1:00 pm

Humanities 111

Live Stream: Join stream

Speaker

- **Matt DeSmith** (Speaker) Chemistry

Description

Oxyanions like nitrates and phosphates are ubiquitous in nature and important to many of the planet's natural functions, but studies have shown that regions of elevated oxyanion concentration are becoming increasingly prevalent. Excess concentrations of these anions can have negative ramifications on both environmental and human health, potentially manifesting as algal blooms which can make water systems toxic to small animals, or even a potentially fatal condition called methemoglobinemia (blue baby syndrome). Of the many methods being developed for nitrate and phosphate remediation, the Nell lab has focused on functionalized sorbents. A small library of functionalized silica adsorbents have been synthesized using fumed silica, cab-o-sil®, by functionalizing the surface with 3-aminopropyltrimethoxysilane via a grafting method. Once the silica surfaces were functionalized with terminal amine groups, the surface was further functionalized with ligands that contained electron deficient aromatics. Some amines were left unfunctionalized to create a multifunctional surface, as an amine surface alone has been shown to bind anions from water. A variety of electron deficient carboxylic acids were purchased and used to create a set of materials with a range of electron withdrawing aromatics, included 4-sulfobenzoic acid potassium salt, 4-(trifluoromethyl)benzoic acid, 4-sulfobenzamide, and 3,5-dinitrobenzoic acid. Characterization of the sorbents was performed with powder X-ray diffraction spectroscopy, infrared spectroscopy, thermogravimetric analysis, and elemental analysis. Materials performance testing is ongoing for nitrate and phosphate.

Faculty Adviser: Kara Nell

Displaying agenda in your event timezone (12:48 PM CDT)

Wednesday, April 14

Sexuality Knowledge Production by Individuals with Developmental Disabilities:The Impacts of the Staff Role in Group Homes

.Oral Presentation Remote | Sociology

Wednesday, April 14

12:20 pm - 12:40 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Isa Schomberg** (Speaker) Sociology

Description

In the U.S. sexuality is now understood to be an integral part of one's identity. However, due to socialization processes and unequal power dynamics, mainstream society tends to dismiss or hide the sexualities of individuals with disabilities. Specifically, society sees individuals with disabilities as incapable of understanding and experiencing their own sexualities. Thus, a socially constructed gap is formed between knowledge about sexuality and individuals with disabilities that is perpetuated by many social institutions throughout the life course. This project aims to provide a better understanding of how the specific power dynamics that exist between individuals with disabilities and staff in group homes play a role in knowledge production about sexuality. I argue that in order to best comprehend the ways in which sexuality is understood by individuals with developmental disabilities, it is necessary to understand how the power dynamics between these individuals and the staff in group homes influence the process of knowledge production about sexuality. For this project, I am conducting a secondary data analysis of related scholarship from a diverse range of interdisciplinary sources, with reference to the theoretical frameworks of Patricia Hill Collins' theory of Black Feminist Epistemology and Kimberlé Crenshaw's theory of Intersectionality. The preliminary results of this study demonstrate that past socialization experiences in healthcare and education are related to current knowledge production processes about sexuality, and that this process is influenced by staff. This analysis is significant for academic and broader society because it discusses an issue that has been understudied and ignored.

Faculty Adviser: Jennifer Rothchild

Displaying agenda in your event timezone (12:48 PM CDT)

Wednesday, April 14

Teaching World Languages with and for Social Justice

.Oral Presentation In-person | Spanish

Wednesday, April 14

12:20 pm - 12:40 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Max Kivi** (Speaker) Spanish

Description

Language learning does not occur in a political, social, cultural, or historical vacuum. To learn a foreign language is to learn another way to see the world and to gain a glimpse into another's perspectives, history, and culture. Since their inception within the United States, far too many world language programs have not strayed from teaching vocabulary, grammar, and stagnant interpretations of culture due to a perceived lack of space in the curriculum or low linguistic abilities of their students. In the last two decades, multiple world language educators and scholars (e.g., Johnson & Randolph, 2017; Glynn, Wesley & Wassell, 2014; Osborn, 2006) have pointed to the importance of recognizing the political nature of language study and using a critical approach to curriculum development by teaching world languages through the lens of Social Justice. In this project Professor Roberts and I use this existing claim as a foundation to highlight the importance of teaching Social Justice in the introductory world language classroom. We argue that as students are being introduced to Spanish, Social Justice pedagogy creates a space where language is acquired alongside intercultural competency and an understanding of past and present injustices seen within and directed towards the diverse Spanish-speaking world and its communities. In addition to researching and studying the existing theoretical frameworks and literature relating to the topic, I am also creating a curriculum that accompanies the Spanish 1001/1002/1003 introductory courses to demonstrate how Social Justice pedagogy can - and should - be used to guide and enrich the early stages of language acquisition.

Adviser: Windy Roberts

Displaying agenda in your event timezone (12:49 PM CDT)

Wednesday, April 14

Selectively Capturing CO2 using Covalent Organic Frameworks

.Oral Presentation Remote | Chemistry

Wednesday, April 14

12:40 pm - 1:00 pm

Humanities 205

Live Stream: Join stream

Speaker

- **Isaac Sanchez** (Speaker) University Of Minnesota Morris

Description

Greenhouse gas emissions are one of, if not the major cause of global warming. With CO_2 emissions rising annually, it is paramount to selectively capture and remove CO_2 from flue gas. One method of capturing CO_2 gas is via porous materials. Covalent organic frameworks (COFs) are porous materials which have been explored throughout this research. Two important features of COFs are the base unit linkage types (BULTs) and the functional groups attached to the organic linkers (OLs). The BULT used in this research was a covalent triazine framework (CTF) and the main functional group used in the OL was NH_3. Both CTF and NH_3 when used in other COFs improved overall selectivities for CO_2. NH_3 in tandem with electron withdrawing groups would theoretically make the N-H bonds more acidic, thus increasing the overall affinity further of the COF. In this research the process in synthesizing the COF is explored in detail as well as the affinity of molecules with CO_2.

Faculty Adviser:Kara Nell

Displaying agenda in your event timezone (12:49 PM CDT)

Wednesday, April 14

The Impact of a Pro-130 Mutation on Malate Dehydrogenase

Biology ,Poster or Visual Display In-person

Wednesday, April 14

1:00 pm - 2:00 pm

Humanities 211

Live Stream: Join stream

Speakers

- **Jordan Wolford** (Speaker) Biology
- **Felicity Alvarado** (Speaker) Biology
- **Asia Kollie** (Speaker) Biochemistry, Dance

Description

Malate dehydrogenase (MDH) is an enzyme that oxidizes malate to oxaloacetate. This reaction occurs during the citric acid in eukaryotes, and requires NAD/NADH as a coenzyme. The citric acid cycle is important to create products needed for eukaryotes to produce ATP, or energy, for the organism. Dysregulation of MDH has been linked to some cancers, however little is known. Previous studies have shown that there is a flexible loop region, located outside of the substrate binding pocket, that is essential for the reaction process, but it is poorly characterized. More specifically, the asparagine, a polar, chain amino acid, at position 130 binds to the carboxamide group of the NAD molecule via hydrogen bonding, to allow for the reaction with MDH to occur. To gain further insight into the importance of this loop region, we mutated the asparagine at position 130 to proline, a nonpolar, ring amino acid in Citrullus lanatus (Watermelon), which is analogous to human MDH, to investigate the effects on the enzymatic activity of MDH. To study the MDH mutation, we expressed and purified the protein by Ni (nickel) affinity chromatography. Once isolated,we ran a SDS-Page that confirmed the purification of the enzyme. We did an enzymatic assay and the oxidation of NADH was measured. We found the mutation to slow down the catalytic activity of MDH by lowering the maximum rate of reaction (Vmax) and increasing the affinity (Km) for the substrate. This indicates that the asparagine at position 130 is essential for normal, catalytic activity of the MDH enzyme.

Faculty Adviser: Danielle Bolland

Displaying agenda in your event timezone (12:49 PM CDT)

Wednesday, April 14

Development of an Undergraduate Lab Procedure through the Extraction of Tea

Chemistry | Poster or Visual Display In-person

Wednesday, April 14

1:00 pm - 2:00 pm

Humanities 11

Live Stream: Join stream

Speaker

- **Joshua Head** (Speaker) Chemistry

Description

Tea is a common beverage consumed by many cultures around the world. In addition to the cultural significance of tea, there is a medicinal component. Research shows some tea contains anti-inflammatory compounds which help relieve headaches and boost the immune system. The development of a course-based undergraduate lab focused on identifying components of tea is important for these reasons; gives students background on chemistry and a cultural drink in society, and allows for education about different cultures. Specific to this work, the cultural aspect is connected to work done by Sierra Paske with Dr. Kara Nell. In this work *M. fistuloso* was studied and brewed to extract compounds. *M. fistuloso* is used as a medicine by Native American tribes to help reduce fever. An advantage of using tea is the product's ability to be analyzed on many different instruments with several techniques. An analytical laboratory setting can use the many instruments/processes to test and then allow students to compare results. The ability to use and evaluate different lab techniques is a critical skill for students to have when moving into the workforce. The lab procedure presented brings together many techniques and delivers the application of them in a way easy to understand and apply. A robust procedure must be thoroughly vetted which requires repeatedly running the experiments to troubleshoot for random and systematic errors; this is demonstrated with the statistical aspect of the lab results.

Faculty Adviser: Jennifer Goodnough

Displaying agenda in your event timezone (12:49 PM CDT)

Wednesday, April 14

Mirrors of Art

Art History | .Oral Presentation In-person

Wednesday, April 14

1:00 pm - 1:20 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Tayler Kalthoff** (Speaker) Art History & Studio Art

Description

A mirror is defined as a flat or curved surface—typically made from glass—with a coating that allows for reflection. The research was done primarily due to my fascination with mirrors in art and I often focus on repetition as a way of mirroring in my own artwork. Throughout my photographic work, mirroring is used as a method of repetition as a way to distort the face and perceive new perspectives of the person to create a new narrative. This research discusses the meaning of mirrors throughout art history and brings connections of what mirrors or mirroring means in these artworks. The meaning of the mirrors varies throughout the pieces in my research and I culminate them all to give one synopsis. Two examples from this research not only give examples of how mirrors are used in work but also connect to my own work. Rokeby Venus by Diego Velazquez is a piece that focuses on the "Venus Effect" where it appears that the person in the painting is looking at themselves due to the angle, but they are actually looking at the viewer. Self-Portrait in a Convex Mirror by Parmigianino uses the mirror as a way to show his abilities in painting—by displaying his knowledge of alternative perspectives. Throughout the pieces in my research, each piece reflects on one's focus of their life and pulls the viewer in with the reflection. With this presentation, I hope for the audience listening to this to think about the meaning of mirrors from a new perspective.

Faculty Adviser: Jimmy Schryver

Displaying agenda in your event timezone (12:50 PM CDT)

Wednesday, April 14

Generating Training Cases for Evolutionary Computation using QuickCheck

.Oral Presentation Remote | Computer Science

Wednesday, April 14

1:00 pm - 1:20 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Erik Rauer** (Speaker) Computer Science

Description

Evolutionary Computation uses evolutionary processes to create programs that solve a given problem. To do so, it randomly generates a population of potential solutions, which are then tested against a set of inputs whose expected outputs are known, called the training set. The best performing solutions are selected to be randomly modified, creating offspring that form the next generation. This process is repeated until a solution is found that is successful for all inputs in the training set, or until a certain number of generations is reached. QuickCheck is a general-purpose commercial software testing tool, which attempts to discover and simplify inputs that fail tests previously written by software developers. In our research, we applied the generation and simplification features of QuickCheck to evolutionary computation. We did so by using QuickCheck to create a new failing training case whenever a program is able to solve a proportion of the already existing training cases. The success and computational efficiency of using QuickCheck was then compared to that of traditional methods without QuickCheck. So far our results indicate that using evolutionary computation methods with QuickCheck yields a similar number of successes, but finds them much more quickly than without QuickCheck. Although we need to expand our testing to include a wider range of problems, these results suggest that using QuickCheck is more computationally efficient than traditional methods.

Faculty Adviser: Nic Mcphee

Displaying agenda in your event timezone (12:50 PM CDT)

Wednesday, April 14

Assembly and Analysis of Mitochondrial Genomes from Sexual and Asexual Ambystoma Salamanders

.Poster or Visual Display Remote | Biology

Wednesday, April 14

1:00 pm - 2:00 pm

Humanities 111

Live Stream: Join stream

Speaker

- **Catherine Drake** (Speaker) Biology

Description

All-female lineages of salamanders within the genus *Ambystoma* may be descendants of the most ancient lineage of unisexual vertebrates. Unisexual *Ambystoma* interact with other sexual species and integrate genetic material from males of these species into their DNA. This unique reproductive cycle results in multiple copies (2-5) of chromosomes and makes constructing evolutionary trees based on DNA sequencing challenging. While offspring will inherit at least one set of chromosomes from each parent, mitochondrial genomes are inherited from the female parent only. Therefore, investigating mitochondrial genomes may provide insight to the evolutionary history of unisexual salamanders. This is especially relevant for genome recombination, the mixing of genetic variation from each parent, which is severely limited in unisexual lineages. We are conducting analyses on mitochondrial genomes collected from 192 *A. jeffersonianum*, *A. laterale*, and *Ambystoma* unisexual individuals from the North American Great Lakes region to compare the evolution between polyploid unisexuals and sexual diploid species. We used established bioinformatic programs and custom computer code to assemble mitochondrial genomes, identify conserved genes that encode for mitochondrial proteins, and analyze the evolutionary rate of genomes between sexual and unisexual groups. This is the largest assembly of mitochondrial genomes analyzed to date and provides a new perspective on the phylogenetic history of these unique animals.

Faculty Adviser: Robert Denton

Displaying agenda in your event timezone (12:50 PM CDT)

Wednesday, April 14

High-Resolution Imaging of Seedling Development in Response to Elevated Temperature and Light

.Oral Presentation Remote | Biology

Wednesday, April 14

1:20 pm - 1:40 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Ryan Weber** (Speaker) Biology

Description

One particular area of interest in plant biology is the impact of climate change on development. This project investigated the process of seedling establishment, which consists of germination, growth of the seedling through the soil, emergence, and production of photosynthetic leafs. Over the course of these studies, two separate ecotypes of *Arabidopsis* (Cvi and Ler) were monitored and conditioned under temperatures of 24, 27 and 30°C respectively, and in the presence/absence of fluorescent lights. The seedlings were monitored to see if time of germination, germination rate, and/or hypocotyl (embryonic stem growth) were altered in response to temperature or light. Genetic differences between Cvi and Ler also allow for study of the contribution of genotype to the response. Data collection was done using the software ImageJ in tandem with high resolution photography for measuring hypocotyl growth and calculating germination time/rate. Elevated temperatures were used to simulate the effects of climate change. Seedlings were also grown either in the presence or absence of light to study different stages of development. General trends were observed, reflecting a delayed rate of germination and growth in Ler at various conditions, but increasing temperature had a positive effect on growth rate. Findings from this study of *Arabidopsis* development could also be reflective of possible future alterations in other C4 plants such as corn and wheat.

Faculty Adviser: Stephen Deslauriers

Displaying agenda in your event timezone (12:51 PM CDT)

Wednesday, April 14

Guillermo Del Toro: The Man Who Loved Monsters

.Oral Presentation In-person | Communication, Media & Rhetoric

Wednesday, April 14

1:40 pm - 2:20 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Thor Riemer** (Speaker) University Of Minnesota-Morris

Description

"Guillermo Del Toro: The Man who loved Monsters" is a descriptive and rhetorical criticism of film director Guillermo Del Toro, as seen through the movies Hellboy (2004), Hellboy II: The Golden Army (2008), and Pan's Labyrinth (2006), and centered by the intersection of Genre and Auteur theories. Analysis of these complementary films serves as a springboard for a deeper examination into the body of work from Del Toro as a singular artist who addresses deeper themes, such as the nature of humanity and the costs of living a moral life. Additional rhetorical consideration of Del Toro's work can be applied to describe his skills as a storyteller and creator. In fact, several additional parallels can be drawn between the films as the analytical methods are applied through deep textual analysis . This paper concludes by explaining the analytical and applied significance of acknowledging Guillermo Del Toro as both an "Auteur" and a "Genre" director.

Faculty Adviser: Barbara Burke

Displaying agenda in your event timezone (12:51 PM CDT)

Wednesday, April 14

Atmospheric contrail detection with a deep learning algorithm

.Oral Presentation Remote | Physics

Wednesday, April 14

1:40 pm - 2:00 pm

Humanities 205

Live Stream: Join stream

Speaker

- **Nasir Siddiqui** (Speaker) Physics

Description

The study of atmospheric contrails and their effects is an active area of research in atmospheric science as their presence in the earth's upper atmosphere has been theorized to contribute to the greenhouse effect and ultimately climate change. Contrails are best identified as elongated, white streaks in the sky that occur due to the condensation of aircraft exhaust. Further study of their visual properties could allow for new insights into the physical conditions that influence their formation and dissipation patterns and how their occurrences vary seasonally. However, due to their tendency to closely resemble other species of clouds such as cirri, it can be a difficult and time consuming task to identify contrails. Our research shows that a machine learning model, specifically a convolutional neural network solves this problem. Using images of the upper atmosphere captured by the U.S Department of Energy's Atmospheric Radiation Management(ARM) at their Southern Great Plains facility, we have developed and trained a supervised model that detects the presence of contrails with high accuracy. On a training set of 1200 images, our model made 1170 correct classifications(97.5% accuracy) and on a validation set of 400 images made 394 correct classifications(98.5% accuracy).

Faculty Adviser: Sylke Boyd

Displaying agenda in your event timezone (12:52 PM CDT)

Wednesday, April 14

Fair is Fowl and Fowl is Fair: Shakespeare's Invasive Birds in North America

.Oral Presentation Remote | Honors

Wednesday, April 14

1:40 pm - 2:00 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Alex Carroll** (Speaker) Honors

Description

One fateful day in 1890, the American Acclimatization Society, led by Eugene Schieffelin, released a flock of European starlings (*Sturnus vulgaris*) in New York. Since then, starlings have spread across the U.S. and become serious invasive species since they can damage crops, vector disease, spread invasive plants, and outcompete cavity-nesting birds. According to later sources, the American Acclimatization Society had decided that North America was incomplete without all the birds referenced by Shakespeare. Although there is minimal evidence to support this literary claim, the society members certainly had birds on the brain, and they were not alone: acclimatization societies across America were introducing European birds, including English sparrows (*Passer domesticus*), chaffinches (*Fringilla coelebs*), and skylarks (*Alauda arvensis*), to the states. Why did some of these species, like the starlings, take flight in America while others died out? What motivated the acclimatization societies to intentionally introduce exotic species? To date, no one has combined these two avenues of research, which can help us understand the distribution patterns of nonnative species. This presentation will combine historical analysis and invasion biology research to argue that the acclimatization societies were motivated by a Victorian notion of ecological imperialism, and the birds' life history characteristics helped determine whether they would thrive or perish.

Faculty Adviser: Margaret Kuchenreuther

Displaying agenda in your event timezone (12:52 PM CDT)

Wednesday, April 14

Characterization and Comparison of Skin Microbiomes Between Polyploid and Diploid Salamanders

.Poster or Visual Display Remote | Biology

Wednesday, April 14

2:00 pm - 3:00 pm

Humanities 5

Live Stream: Join stream

Speaker

- **Fiona Kaster** (Speaker) University Of Minnesota Morris

Description

Salamanders are one of the many amphibian groups at risk due to climate change and fungal pathogens. Unlike other vertebrates, amphibians possess a porous skin that is colonized by microbiota and influenced by their own skin secretions. To test how genomic composition influences the growth of skin microbiomes, I used two species of salamander (*A. laterale* and *A. jeffersonianum*) and an all-female lineage of salamander hybrids that possess genomic contributions of both species. I swabbed 72 *Ambystoma* salamanders (*A. jeffersonianum*, *A. laterale*, and unisexual salamanders), extracted DNA from the swabs, and sequenced the DNA at a barcode gene used for identifying bacteria. I used the bioinformatics pipeline Qiime2 to compare alpha and beta diversity between unisexual and sexual salamanders and between unisexuals of different genomic compositions and locations. This information will help us understand if a difference in genomic composition translates to a difference in their phenotypic microbiome.

Faculty Adviser: Robert Denton

Displaying agenda in your event timezone (12:52 PM CDT)

Wednesday, April 14

Experiential Learning and the Medieval Book: Rebinding the Codex One Quire at a Time

Medieval Studies | .Poster or Visual Display In-person

Wednesday, April 14

2:00 pm - 3:00 pm

Humanities 11

Live Stream: Join stream

Speaker

- **Cameron Anderson** (Speaker) Medieval Studies

Description

My research will engage with medieval codex processes to make two Romanesque codices which will serve as teaching objects in the library's manuscript collection. One codex will be unbound to show the inner structure of a codex and the other will be bound to show the outer structure. These pedagogical items will be unique to the Medieval and Ancient Studies Program at UMN-Morris and will allow students and faculty to participate in hands-on learning to gain a deeper understanding of the codices on which the stories they study reside. This research will inform myself and those who later use these objects about material history and physical production of these objects and an accompanying paper that will describe the medieval processes of codex production. The materials that are used to make the codices include: goat parchment, goat leather, wheat starch, beech wood, waxed thread, and other common bookbinding materials. I will begin by cutting the parchment into small rectangular pieces to make the quires and thread them together, then I will sand and chisel the wood to size and attach it to the parchment, finally I will use an adhesive to stick the leather to the wood to complete my bound codex. The book *The Archaeology of Medieval Bookbinding* by János Alexander Szirmai defines the Romanesque period and its qualities, and the book *Introduction to Manuscript Studies* by Raymond Clemens and Timothy Graham provides a more general medieval bookbinding process which I will follow.

Faculty Adviser: Lisa Bevevino

Displaying agenda in your event timezone (12:52 PM CDT)

Wednesday, April 14

Synthesis of Unsymmetrical Bidentate Phosphines via Unsymmetrical Bisphosphine Oxides

.Poster or Visual Display In-person

Wednesday, April 14

2:00 pm - 3:00 pm

Humanities 111

Live Stream: Join stream

Speaker

- **Vivian Vue** (Speaker) Chemistry

Description

Phosphines are often used for the synthesis of ligands for transition metals to produce a catalyst. In more recent years, there is a growing demand for catalysts with novel catalytic properties. However, organophosphorus chemistry is difficult to work with as it is air sensitive. To work around this issue, this research project has looked at synthetic methods in which secondary phosphine oxides (SPOs) are used for the starting materials since they are easier to work with and are air-stable precursors. Therefore, the objective of this research is to synthesize unsymmetrical bidentate phosphines using SPOs. More specifically, the synthesis of diethyl(3-(dimethylphosphoryl)propyl)phosphine oxide, using the starting materials (3-chloropropyl)diethylphosphine oxide, dimethyl phosphine oxide, and sodium bis(trimethylsilyl)amide (NaHMDS) for a substitution reaction. Due to the impurities after the substitution reaction and workup, alumina column chromatography was performed before the reaction was reduced to 1-dimethylphosphino-3-diisopropylphosphinopropane in an air-free environment via the glove box and the Schlenk line. Throughout each experimentation, the reaction was characterized via ^{1}H NMR and ^{31}P NMR to test whether unsymmetrical bis(phosphine) oxides or unsymmetrical bidentate phosphines were present. The findings of the research suggest that the unsymmetrical bidentate phosphine of interest was synthesized, therefore the next step to produce the chiral-at-metal complex can proceed. That way, the catalytic properties of the complexes with unsymmetrical phosphines can be tested and compared to others with different R groups.

Faculty Adviser: Bryan Nell

Displaying agenda in your event timezone (12:53 PM CDT)

Wednesday, April 14

Testing Differential Endurance in Unisexual and Sexual Ambystoma Salamanders

.Poster or Visual Display Remote | Biology

Wednesday, April 14

2:00 pm - 3:00 pm

Humanities 211

Live Stream: Join stream

Speakers

- **Anna-Helena Preugschas** (Speaker) Biology
- **Asia Kollie** (Speaker) Biochemistry, Dance

Description

Unisexual Ambystoma salamaders are the oldest linage of unisexual vertebrates. They are able to reproduce by kleptogenesis, which is when a polypoid unisexual female salamander is able to produce a clonal offspring by sperm stimulation from a another sexual male salamander. Unisexuals are also able to "steal" sperm from males of a congeneric sexual Ambystoma salamander. Previous research has investigated the differences in endurance and dispersal patterns between unisexuals and A. texanum as an explanation for how these groups coexist with one another, and suggested mitochondrial DNA mismatch as a possible mechanism. Here we expand upon previous work by testing the endurance of more individuals from more species (unisexuals, A. jeffersonianum, A. texanum, and A. laterale). We tested endurance by placing individuals on treadmills and recording the distance traveled and the duration of time the individual traveled before failing a righting response. Reinforcing the findings of the previous study, the unisexual individuals displayed significantly lower stamina compared to sexual individuals, though fewer trials were completed for sexual individuals than unisexual individuals due to the extreme length of time required for each trial.

Displaying agenda in your event timezone (12:53 PM CDT)

Wednesday, April 14

Hustlers: A Feminist Take On The Heist Genre

.Oral Presentation In-person | Communication, Media & Rhetoric

Wednesday, April 14

2:20 pm - 2:40 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Luke Whitney** (Speaker) Communication, Media, and Rhetoric

Description

Since the conception of the heist genre of film in 1950 through today, most Hollywood products maintain the status quo, focusing on cisgender, heterosexual wealthy white men and their criminal escapades, with the crimes and lifestyle of the criminals being treated as glamorously aspirational. This project, "Hustlers: A Feminist Take on The Heist Genre", challenges the conventional standards by examining, rhetorically analyzing, and evaluating the dramatic 2019 crime film Hustlers through the lens of feminist theories of communication. By expanding beyond examining the general conventions, an in-depth analysis on Hustlers' characters and storylines are shown to be responsible for promoting messages about female empowerment while humanizing the struggles of women (and especially women of color) within the sex-work industry. Furthermore, by looking beyond the content of the film itself, to the work done behind the camera by director Lorene Scafaria, a feminist message emerges. Through the investigation of this film, and the ways it brings this story to light, the themes and messages of the classic heist films contrast significantly with what Hustlers suggests.

Faculty Adviser: Barbara Burke

Displaying agenda in your event timezone (12:53 PM CDT)

Wednesday, April 14

Exploring Personal Narratives through Ceramic Sculpture

.Oral Presentation Remote | Studio Art

Wednesday, April 14

2:40 pm - 3:00 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Molly Otremba** (Speaker) Studio Art

Description

My artistic work explores biomorphic, organic abstractions of the emotions I experience when processing the possibility of inheriting Huntington's Disease (HD). HD is a rare, neurodegenerative disorder that affects nerve cells in the brain. I find that constructing complex ceramics sculptures offers a means of healing through vulnerability, giving me the opportunity to maintain some control, even when the result is determined by the process. Still allowing myself to play, I create altered traditional vessel shapes that have themes of superficial protection. Specifically, I built double-walled ceramic vessels with carved and additive surface design to convey deteriorating brain elements. I continuously find unconscious reasons for why I am drawn to specific aspects of creating these double-walled sculptures; the intricate interior form seeking exposure parallels my need to express traumatic torment while also needing to shield and protect myself emotionally. My presentation explains how the manual engagement of creating three-dimensional artworks allows me to cope with debilitating emotions and gives me a better understanding of my HD identity. In turn, I hope for my audience to reflect on their own methods of dealing with complex emotions through their own artistic outlets.

Faculty Adviser: Andrew Stansbury and Jimmy Schryver

Displaying agenda in your event timezone (12:53 PM CDT)

Wednesday, April 14

Synthesis of Transfer Hydrogenation Catalysts Containing Unsymmetrical Bisphosphines

Chemistry | Poster or Visual Display In-person

Wednesday, April 14

3:00 pm - 4:00 pm

Humanities 11

Live Stream: Join stream

Speaker

- **Nora Fritz** (Speaker) Chemistry

Description

Asymmetric catalysis, where a metal catalyst is used to transform a substrate into a single enantiomer of product, has become a popular synthetic technique in both academic and industrial settings. An enantiomer is a single molecule with a unique three-dimensional shape with a mirror image not superimposable on the original. The chirality, or right or left-handedness, of compounds lead to applications important in the pharmaceutical and agrochemical industries. Commonly, a metal complex's ability to create a product of a certain enantiomer relies on a chiral group being attached to the metal. However, having the chirality of a metal complex depend on the attached ligands being unsymmetrical is an underexplored area. Such a complex would be considered "chiral-at-metal," where the metal itself would become a chiral center. This type of complex would allow for the usage of achiral phosphines, which are cheaper and easier to synthesize than chiral phosphines. Ruthenium complexes have shown great catalytic activity in transfer hydrogenation reactions, demonstrating product yields of 100% in one study. Such complexes can thus be analyzed in asymmetric catalysis with differing ligands. We will synthesize chiral-at-metal complexes and their catalytic success will be explored through the transfer hydrogenation of acetophenone. The future of this research lies in creating effective complexes using metals such as ruthenium, and eventually iron and cobalt or other more affordable metals.

Faculty Adviser: Bryan Nell

Displaying agenda in your event timezone (12:54 PM CDT)

Wednesday, April 14

Anion Removal by Partially Positive Adsorbents

Chemistry | Poster or Visual Display Remote

Wednesday, April 14

3:00 pm - 4:00 pm

Humanities 5

Live Stream: Join stream

Speaker

- **Breanna Dragseth** (Speaker) Chemistry

Description

Nitrates and phosphates exist naturally but are present in elevated concentrations in many areas primarily due to agriculture; these elevated concentrations are concerning for human and environmental health. The project considered the ability of four different materials used for adsorption (adsorbents) to adsorb nitrate and phosphate. All adsorbents had a silica base with an amine (NH_2) group and were further functionalized with different ligands consisting of an aromatic ring functionalized with electron withdrawing groups, creating a partial positive environment to help attract the anions of interest. We also synthesized control materials to determine how effective our engineered materials are. The controls are the base silica, silica functionalized with an amine group, and materials further functionalized with an aromatic group that is not electron deficient. The goal of this project was to confirm adsorption of nitrate and phosphate to positively charged adsorbents for their extraction from aqueous solutions. The materials were designed, synthesized and properly characterized. The materials must be tested for their adsorbent ability via a contact test in a known contaminant solution, which is currently underway. If results suggest that the adsorbents work sufficiently at removing contaminants, the implications of this project could provide a removal pathway for the anionic contaminants from aquatic solutions.

Faculty Adviser: Kara Nell

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Displaying agenda in your event timezone (1:12 PM CDT)

Wednesday, April 14

Speaking Up, Being Brave, Strong, and Funny: "A Rhetorical Analysis of The Marvelous Mrs. Maisel"

.Oral Presentation In-person | Communication, Media & Rhetoric

Wednesday, April 14

3:00 pm - 3:20 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Marie Anderson** (Speaker) Communication, Media, and Rhetoric

Description

The Marvelous Mrs. Maisel --an award-winning Amazon Prime TV series--contains several narrative and visual elements which work together to create a story representing Midge Maisel's journey as the main character.. Auteur theory, which emphasizes the themes and artistry found in the works of an artist/creator is thus used to rhetorically examine the the first season, finding several qualities that the main characters in shows created by Amy Sherman-Palladino are known to exhibit. Formalism also is used as a rhetorical system, to study the elements of theme and setting--stand-up comedy and the 1950's --that are distinctly part of The Marvelous Mrs. Maisel. Through her combination of new and familiar elements, Sherman-Palladino creates, with the growth of Midge Maisel, a story that indicates a shift towards contemporary feminist beliefs and enlarged possibilities for women not only in comedy, but also in society.

Faculty Adviser: Barbara Burke

Displaying agenda in your event timezone (12:54 PM CDT)

Wednesday, April 14

Survival Time Analysis of Driver Turnover and Sleep Apnea Treatment Within a Large Motor Carrier

Economics ,Poster or Visual Display In-person

Wednesday, April 14

3:00 pm - 4:00 pm

Humanities 111

Live Stream: Join stream

Speaker

- **Isaac Johnson** (Speaker) Economics

Description

This project analyzes data from a large motor carrier in a high-turnover part of the truck driver labor market. The primary objective is to examine to what extent adherence to treatment for obstructive sleep apnea (OSA) through the nightly use of a CPAP machine, among drivers who have tested OSA positive, is associated with driver exit. Past research has shown that compliance levels do affect how long it will take a driver to exit, whether by quitting or being fired. I will use statistical techniques for analyzing time to an event. The event in this study is a driver exiting the firm. I will first replicate past descriptive statistical work using Kaplan-Meier survival curves with the length of job tenure until exit as the analysis variable. I will examine how the time until exit varies by relevant OSA categories, principally focusing on treatment compliance sub-groups, full compliance, partial compliance and no compliance. Then I will apply the Cox proportional hazards multivariate survival model, which will allow me to adjust for the influence of other variables that may affect driver exits, such as age, sex, the area of the country they operate in, etc. This work will extend prior analysis by the Truckers & Turnover Project, work which is of policy interest to the US Department of Transportation, and to the managers of motor carriers.

Faculty Adviser: Stephen Burks and Jon Anderson

Poster visual: https://drive.google.com/file/d/1P80y10MWJb-rzcZoj3JO9cSABdQmH-yt/view?usp=sharing

Displaying agenda in your event timezone (12:54 PM CDT)

Wednesday, April 14

Conjunction of Factors Impacting The 2019-2020 Flu Season in the US

.Oral Presentation Remote Statistics

Wednesday, April 14

3:20 pm - 3:40 pm

Humanities 6

Live Stream: Join stream

Speaker

- **Yichen Wang** (Speaker) Statistics

Description

The 2019-2020 flu season is regarded as one of the most serious ones in decades. Previous researchers usually studied the effects of different factors on seasonal flu separately instead of their conjugate impact, so we wanted to find how multiple factors combine to affect the spread of influenza in the 2019-2020 flu season in America. We chose types of virus(A and B), environmental factors (temperature, precipitation, relative humidity), population density, and influenza vaccination status for different age groups which are statewide data containing monthly information from Sep. 2019 to May 2020. By principal component analysis, we could see the importance of different factors as well as the general relationship between them. Furthermore, using path analysis enabled us to investigate the causal relationship between factors more precisely than the previous method. We found that two virus types have different relationship patterns with other remaining variables: Type A virus is strongly negatively related to temperature (lower temperature tends to cause more cases), and is also somewhat related to some vaccination groups, while the significance of any vaccination group doesn't show up in Type B virus. Moreover, there are relationships between factors, like the vaccination rates for different age groups are strongly correlated to each other. Our findings could provide general advice to you during flu season. For instance, if the temperature is relatively low one year, then you could be aware that it's more likely for you to be infected. In addition, since the influenza situation is somewhat similar to COVID-19, our findings might also be helpful for you to protect yourself.

Faculty Adviser: Engin Sungur

Displaying agenda in your event timezone (12:55 PM CDT)

Wednesday, April 14

Criminal Liability of Artificial Intelligence

.Oral Presentation Remote | Philosophy

Wednesday, April 14

3:40 pm - 4:00 pm

Humanities 205

Live Stream: Join stream

Speaker

- **Vincent Fontana** (Speaker) Philosophy

Description

Artificial intelligence entities (AI) are increasingly dangerous to property and persons. Since we use the criminal law to control dangerous people, can we use it to control dangerous AI? Upon first glance it appears that AI cannot be punished, in part because it cannot be considered criminally liable for their conduct. Yet some argue that AI can be considered criminally liable. Gabriel Hallevy proposes what I call the Legal Tradition model, arguing that AI can be held criminally liable since they meet the two legal requirements of an offender: mens rea and the actus reus. Another view, the Kantian Moral Agency model developed by Kendy Hess, outlines the criteria for non-human entities—such as corporations—to be morally responsible for their conduct. This includes being self-regulating through self-authored principles, to which I argue that AI can indeed meet Hess' criteria. However, after recognizing that both models cover much of the same ground, but are not entirely the same stance, I suggest that Hallevy's view ought to be adopted when these two models are in conflict with each other.

Faculty Adviser: Dan Demetriou

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Displaying agenda in your event timezone (12:55 PM CDT)

Wednesday, April 14

Closing Remarks from Vice Chancellor of Academic Affairs, Janet Schrunk Ericksen

Wednesday, April 14

4:15 pm - 4:25 pm

Edson Auditorium

Live Stream: Join stream

Speaker

- **Janet Schrunk Ericksen** (Speaker) Vice Chancellor of Academic Affairs, University of Minnesota, Morris

Description

Our Vice Chancellor of Academic Affairs, Janet Schrunk Ericksen, will offer closing remarks.

Displaying agenda in your event timezone (12:55 PM CDT)

Wednesday, April 14

Alone Together: Dancing through Quarantine

Dance | .Performance In Person | .Feature Presentation

Wednesday, April 14

4:15 pm - 5:00 pm

Edson Auditorium

Live Stream: Join stream

Speakers

- **Gracie Arends** (Speaker) Dance
- **Danielle Domka** (Speaker) Dance
- **Kristen Shaw** (Speaker) Dance
- **Ashley Kennedy** (Speaker) Dance
- **Asia Kollie** (Speaker) Biochemistry, Dance

Description

Dance is an opportunity to build and energize the community. The community extends to both the performers and the audience, and both of these groups experienced being separated by space during enforced quarantines throughout the global COVID-19 pandemic in 2020. The performance of *Alone Together* was directed by Stephanie Ferrian to music that will set the mood of the identified stages. *Alone Together* is composed of 5 sections that explores movement telling the narrative of isolation and provides a storytelling of events of quarantine. In the third section, original choreography was created by the student choreographers Gracie Arends, Paul Decker, Danielle Domka, Ashley Kennedy, Asia Kollie, Kristen Shaw. As student choreographers and performers our challenge was to cultivate movements that would tell our individual stories of quarantine and be able to express and translate that experience to the audience. Following the performance of the *Alone Together* choreographed section we will discuss our individual process in completing this common goal of our performance in *Alone Together*.

Faculty Adviser: Stephanie Ferrian